

---

**Problem of the Day 1**

The year 1881 is special because you can read it upside down or right side up. When was the last time there was a special year like that?

---

**Problem of the Day 2**

The number sentence  $10 < 20$  uses the digits 0, 1, and 2 and the less than ( $<$ ) symbol. Use the digits 0, 1, and 2 and the symbols  $<$  and  $>$  to make as many other number sentences as you can.

---

**Problem of the Day 3**

Jed is making a tile tabletop. He plans to have 4 rows with 4 tiles in each row. His tiles are tan, pink, gray, and red. How can Jed arrange them so each row and each column has one tile of each color in it?


---

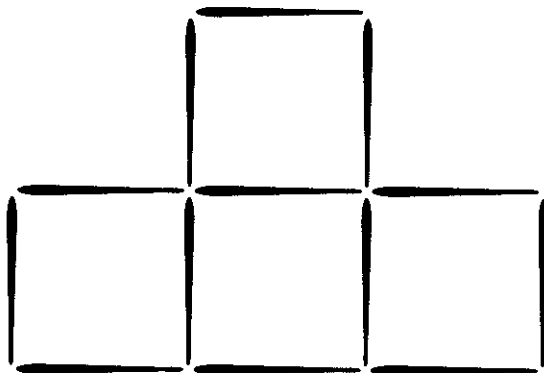
**Problem of the Day 4**

Zena bought a parrot for \$30. She sold it for \$40. The next day she bought the same parrot back for \$50. Then she sold it again for \$60. Did Zena make money or lose money? How much?

---

### Problem of the Day 5

How can you remove one toothpick and still have three squares of the same size?



---

### Problem of the Day 6

Burger Barn is having a "Burger Bash." During the special sale, customers can buy one hamburger for 35¢, two hamburgers for 55¢, three for 75¢, and so on. If the Millers bring \$2.00 to the Burger Bash, how many burgers can they buy?

---

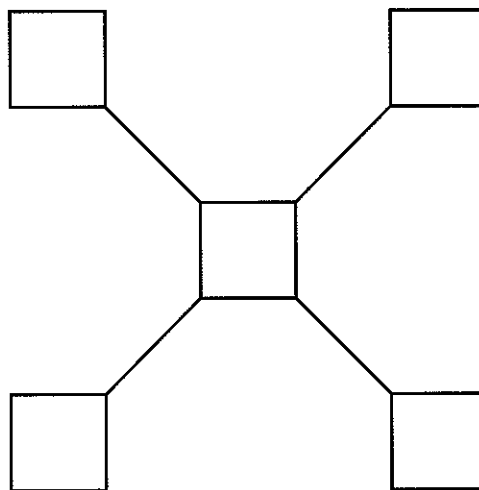
**Problem of the Day 7**

Darla has two coins that equal  $11\text{¢}$ . One of the coins is not a penny. What coins does she have? Explain your answer.

---

**Problem of the Day 8**

Write the numbers 1, 3, 5, 7, and 9 in the boxes. Make the sum of every row 15.



---

**Problem of the Day 9**

Miranda collected 11 shells at the beach. She gave 3 shells to her brother and 2 to her sister. Then she traded her biggest shell for 5 small shells. Now how many shells does Miranda have?

---

**Problem of the Day 10**

Twelve children were at the playground. There were twice as many children playing on swings as there were playing Frisbee. How many children were doing each activity?

---

**Problem of the Day 11**

Five clowns walked single file in a circus parade. Blippo was between Elmo and Fleegle. Fleegle followed behind Clara. Dilly led the parade on his stilts. In what order did the five clowns walk?

---

**Problem of the Day 12**

Brian and Debra are reading. Brian reads from the top of page 5 to the bottom of page 15. Debra reads 10 pages. How would you compare the number of pages the two children have read?

---

**Problem of the Day 13**

The key for number 5 does not work on Hector's calculator. How can he use his broken calculator to subtract  $235 - 198$ ?

---

**Problem of the Day 14**

Each symbol in the code stands for a different number. A symbol means the same number whenever it repeats. Find the value of the three symbols in this pair of number sentences.

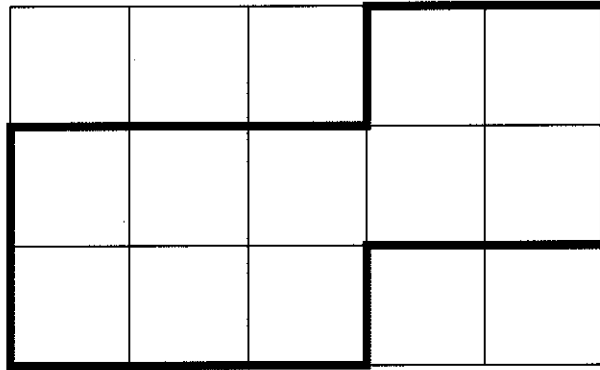
$$\# + * = !$$

$$* - \# = \#$$

---

**Problem of the Day 15**

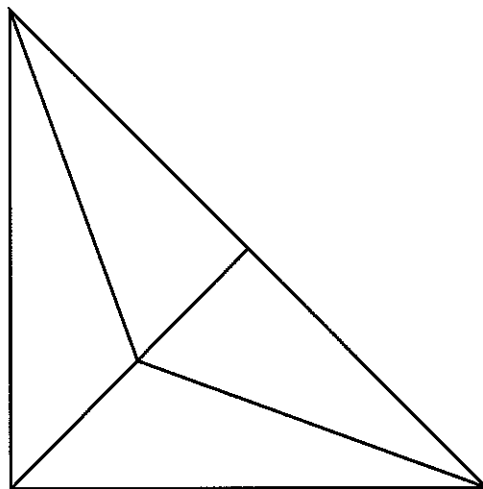
How can you cut this figure along grid lines so that you have two pieces of the same size and shape?



---

**Problem of the Day 16**

How many triangles can you count in this figure?



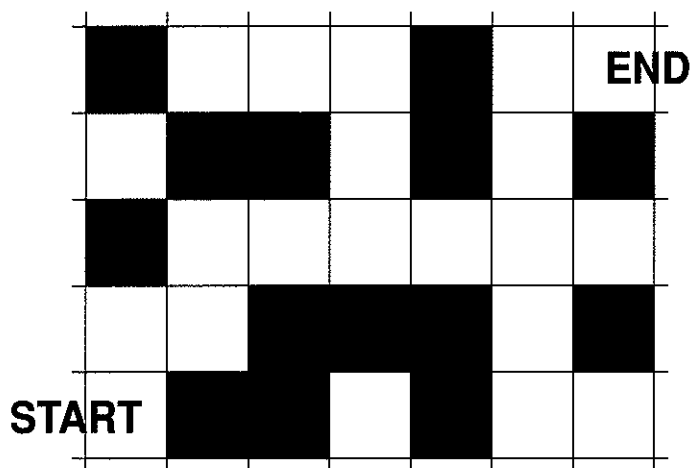


---

### Problem of the Day 17

Find the way through the box maze. You must follow two rules:

- (1) You can move across or up but *not* diagonally.
- (2) You must take turns going through black boxes and white boxes—first a black box, then a white box, then a black box, and so on.



---

### Problem of the Day 18

Use the digits 0, 1, and 2. What are ten different 3-digit numbers you can make? *Hint:* 021 does not count, 221 does.

---

**Problem of the Day 19**

Yvonne folds a piece of paper in half, top to bottom, and then in half again, left to right. While the paper is still folded, she cuts out a triangle at the corner where the folds meet. What shape will she see when she unfolds the paper?

---

**Problem of the Day 20**

Picture some different times on a digital clock. Imagine that the times are 3-digit or 4-digit numbers. What time is it when you see the greatest 4-digit number? When you see the greatest 3-digit number? What time is it when you see the least 4-digit number? When you see the least 3-digit number?

---

**Problem of the Day 21**

Baker, Taylor, Cooper, Tinker, and Weaver are towns on a road that runs from east to west. Baker is the farthest west. Baker is 20 miles from Taylor but 10 miles from Weaver. Cooper is 2 miles west of Taylor and 1 mile east of Tinker. What is the order of the four towns that you would pass on your way to Baker?

---

**Problem of the Day 22**

Bases are 90 feet apart on a real baseball diamond. A school built a baseball diamond for children with half that distance between bases. About how far on a real diamond would a ball player run who hit a double? About how far would a child playing in the school ball field run for a double?

---

**Problem of the Day 23**

Eric said, "I saw about 20 movies last summer." If 20 was the number of movies rounded to the nearest ten, list all the possible numbers of movies he could have seen.

---

**Problem of the Day 24**

Wanda went to a horse show. She saw 10 horses in a parade. If each horse had a rider on its back, how many legs were in the parade?

---

**Problem of the Day 25**

Picture a stack of pennies as tall as one penny that stands on its edge. Guess the value of the stack, then make a penny stack to test your guess.

---

**Problem of the Day 26**

Manny takes 6 coins to a carnival. He has no half-dollars or pennies, and he has 1 quarter. If his favorite carnival game costs 10¢ per turn, what is the greatest number of tries he can take?

---

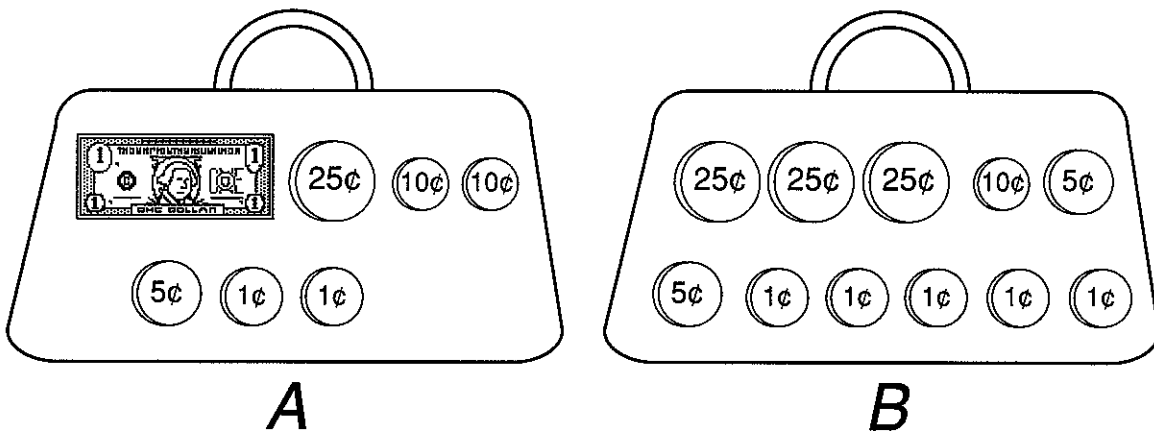
**Problem of the Day 27**

When Heather paid for her movie ticket, she gave the clerk 2 one-dollar bills, 3 quarters, 7 nickels, and 5 pennies. The clerk said, "You still owe me a dime." How much was a movie ticket?

---

**Problem of the Day 28**

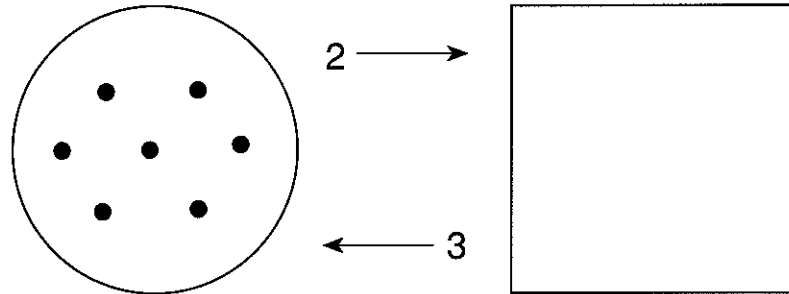
Move 2 coins from one purse to the other so that both purses A and B hold the same amount of money.



---

**Problem of the Day 29**

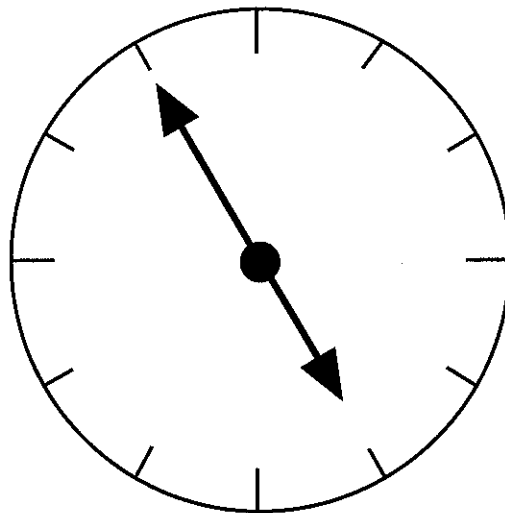
There are 7 marbles in the circle. How could you get all 7 marbles into the box by moving them in groups of only 2 or 3 at a time? You must follow this rule: Groups of two may only move to the *right*, and groups of 3 may only move *left*. How could you move all 7 marbles from the circle to the box?



---

**Problem of the Day 30**

Darnell saw a reflection of his clock in the mirror. It looked like this. What was the real time?



---

**Problem of the Day 31**

Between noon on Sunday and noon on Monday, how many times does the minute hand on a clock point directly at the 3? At the 4?

---

**Problem of the Day 32**

If there are twelve 25-cent stickers in a dozen, how many 50-cent stickers are in a dozen?



---

**Problem of the Day 33**

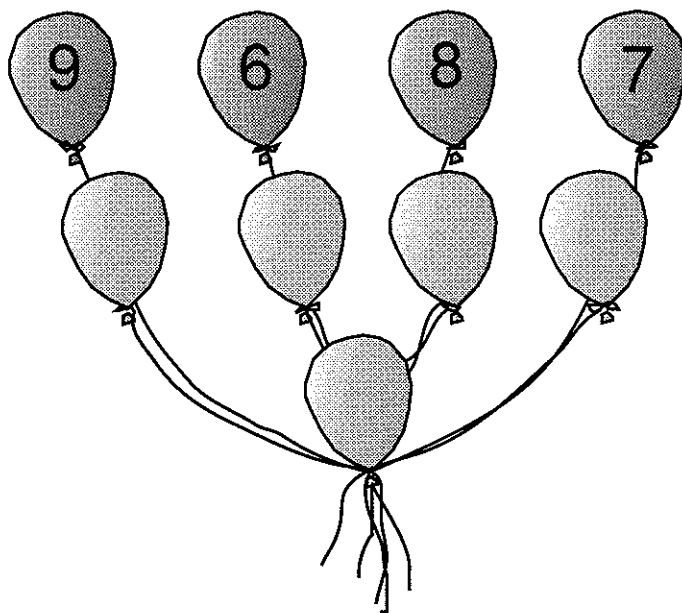
Find the pattern. Write the next number.

2, 5, 10, 17, \_\_\_\_?

---

**Problem of the Day 34**

Use the digits 1, 2, 3, 4, and 5 to fill the empty balloons. The sums along each string must be the same. Use each digit only once.



---

**Problem of the Day 35**

Ford has 28 red marbles, 34 blue marbles, 47 green marbles, and 52 yellow marbles. He needs 80 marbles for a tournament. Which marbles should he bring so that he only brings 2 colors? Explain your idea.

---

**Problem of the Day 36**

Moro wants to buy a pen that costs 39¢, a pad for 47¢, and an eraser for 22¢. He has a can of quarters. How many of the quarters will he need?

---

**Problem of the Day 37**

Banks wrap loose coins in paper or plastic rolls for easy counting. A penny wrapper holds 50 pennies, a nickel wrapper holds 40 nickels, and a dime wrapper holds 50 dimes. How much money would you have if you had one of each of these kinds of coin rolls?

---

**Problem of the Day 38**

Ann, Bo, and Carl want to have a picture taken at the Phunny Photo booth. If they all want to be in the picture, in how many different orders can they sit?

---

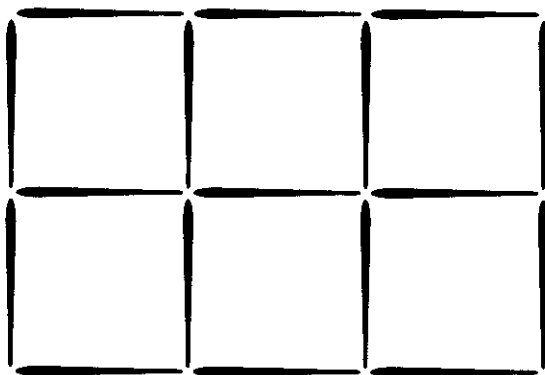
**Problem of the Day 39**

Risa dropped her book. It fell open to an even-numbered page that faced an odd-numbered page. The sum of the pages was 57. What were the open page numbers?

---

**Problem of the Day 40**

Take away 5 toothpicks so that only 3 squares are left.



---

**Problem of the Day 41**

Fill in the missing digits in the subtraction problem.

$$\begin{array}{r} \square 4 \square \\ - 2 \square 9 \\ \hline 369 \end{array}$$

---

**Problem of the Day 42**

Aaron, Bill, Caryn, and Diane were playing a game. They sat around a square table, with partners sitting opposite each other. The girls were not partners. Children with rhyming names were not partners. Who were the partners?

---

**Problem of the Day 43**

Chloe saw two hats she liked at the Hat Hut. Both hats together cost \$20. The difference in price between them is \$4. What was the price of each hat?

---

**Problem of the Day 44**

Len buys bus tokens from a machine at the bus stop. A token costs 30¢. The machine does not give change and cannot take pennies. How many different ways can Len pay for a bus token?

---

### Problem of the Day 45

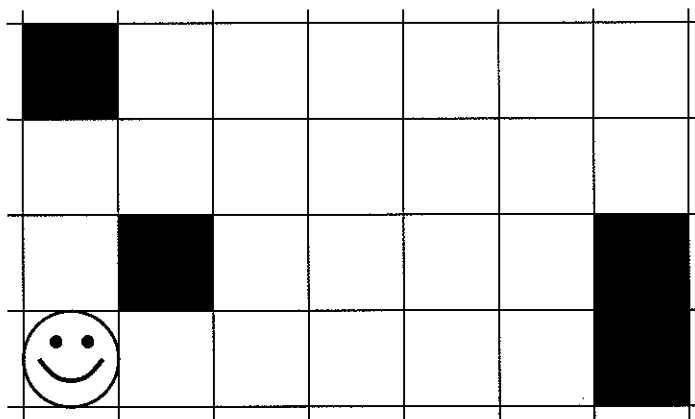
Arrange the digits 3, 4, 5, 6, 7, and 8 to form 2 three-digit numbers that have:

- a. the greatest sum.
- b. the greatest difference.

---

### Problem of the Day 46

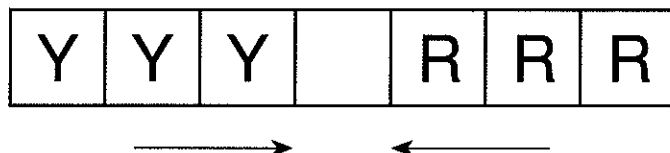
Find a path through every box in the grid (except for the shaded boxes). You may move across ( $\leftrightarrow$ ) or up and down ( $\updownarrow$ ), but not diagonally. Do not go back through a box you have already been in. Start and end at the box with the smile in it.



---

**Problem of the Day 47**

Use 6 counters. Put 1 red counter in each R box. Put 1 yellow counter in each Y box. Leave the middle box open. The object of this puzzle is to slide or jump the counters so that the colors switch sides and the middle box is open again. Yellow counters may move only right, and red counters may move only left. How many moves do you need to make the switch?



---

**Problem of the Day 48**

Uri asked 28 classmates to vote on their favorite bicycle. He found that 17 classmates chose the Puma J-15, 11 liked the Zoom 99, and 5 picked the Star XK. What is wrong with the data? How could this happen?



---

**Problem of the Day 49**

At noon, a clumsy caterpillar falls into a well that is 18 feet deep. Slowly and steadily, it climbs up the slippery sides on its way to the top. Each hour the caterpillar climbs 4 feet up but slides back 1 foot when it stops to rest. At this rate, what time will the caterpillar escape the well?

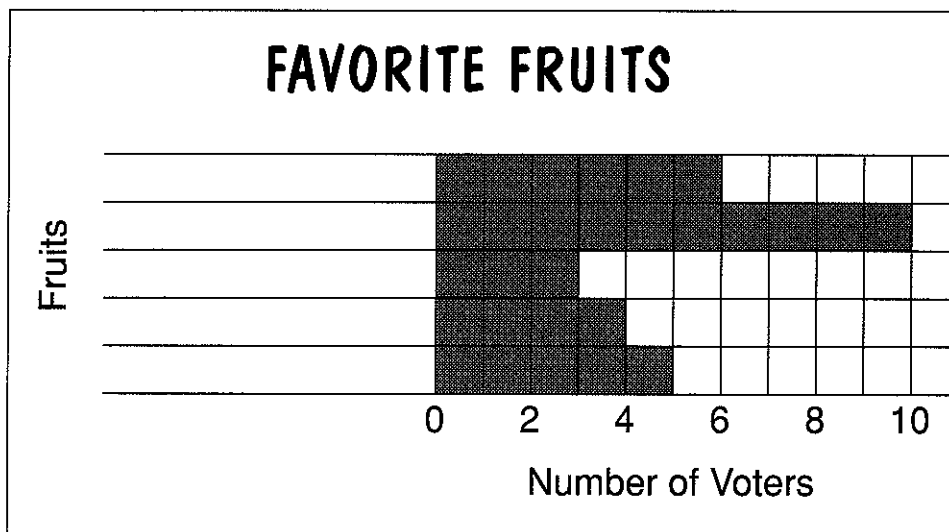
---

**Problem of the Day 50**

After a party, Flori had 3 helium-filled balloons left. During the party, she gave out 10 balloons. She used 8 balloons to decorate her front door, but by the end of the party 7 of them burst. How many balloons did Flori have before the party started?

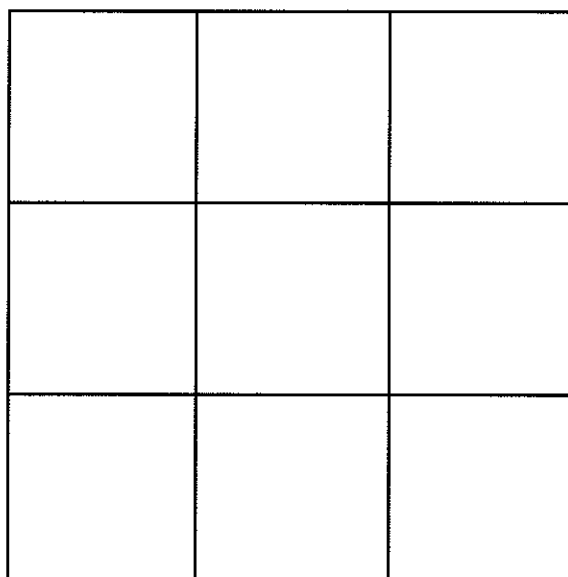
### Problem of the Day 51

Carey forgot to label the bars on a graph of favorite fruits. Use the clues to label the bars. Grapes were the least popular fruit. Some people chose pineapple. Watermelon got as many votes as its syllables. Bananas got as many votes as apples and watermelon together.



### Problem of the Day 52

How many squares are in the figure below?



---

**Problem of the Day 53**

A sign beside Paul's pool says, "No swimming until the temperature hits 75°F!" When Paul checks the poolside thermometer at 7:43 A.M., he sees that it says 57°F. If it steadily gets 1°F warmer every 15 minutes, will Paul be allowed to go into the pool at noon?

---

**Problem of the Day 54**

Carlotta puts a dozen bananas in the gorilla's cage. When she comes back after 15 minutes, all but 4 of the bananas are gone. How many bananas does Carlotta see? Explain your answer.

---

**Problem of the Day 55**

Lori and Benito both want to use the soccer ball at playtime. Since they cannot agree, they decide that Lori will roll a number cube. Lori says, "If I roll a 3 or higher, I use the ball, but if I roll less than a 3, *you* can use it." Is Lori's plan fair? Explain your thinking.

---

**Problem of the Day 56**

Four children sit in a circle while a fifth child, who is "it," covers his or her eyes. One of the four children hides a penny in his or her fist. All four children hold out both of their closed fists, and the child who is "it" guesses where the penny is. Which is harder, picking the correct person or the correct fist? Explain.

---

**Problem of the Day 57**

Amelia, Elizabeth, and Pia are having a writing race. Each girl writes her name as fast as she can 10 times. Who would you predict as the winner? Why? What might affect the results?

---

**Problem of the Day 58**

A mystery story Bradley wrote has 11 pages. He decides to number the pages with word names instead of with numerals. Will he write more vowels or more consonants? Make a prediction, then find a way to test your prediction.

---

**Problem of the Day 59**

Arliss puts her doll collection on a display rack. She puts 1 doll on the top shelf. She puts 3 dolls on the second shelf. She puts 5 dolls on the third shelf, and so on. How many dolls are in the collection if Arliss follows the pattern on 8 shelves?

---

**Problem of the Day 60**

Four students are collecting pinecones for a class project. Each student holds 2 bags in each hand. Each bag has 2 pinecones in it. How many pinecones have been collected in all?

---

**Problem of the Day 61**

Ned and Ted are brothers. Find their ages from these clues:  
Their ages have an even sum but an odd product. Ted is 2 years younger than Ned.

---

**Problem of the Day 62**

For Field Day, the gym teacher made equal teams among the 24 students. Find all the ways that the 24 students can form smaller equal teams for different Field Day races and contests.

---

**Problem of the Day 63**

How much is half of half of half of 200?

---

**Problem of the Day 64**

Nat loves the Bug Abode at the zoo. He learned that ants have 6 legs, and spiders have 8 legs. In an exhibit of rare spiders and ants, Nat counted 36 legs. How many ants and spiders were in the exhibit?



---

**Problem of the Day 65**

An empty wooden crate weighs 6 pounds. What could you put in the crate so that the crate will weigh only 5 pounds? Explain your idea.

---

**Problem of the Day 66**

Megan went to a card shop. Every greeting card cost \$1. But the store was having a special sale. The sale sign said, "Buy 4 cards, get 1 card free." Megan bought 21 greeting cards. How much did she have to pay?

---

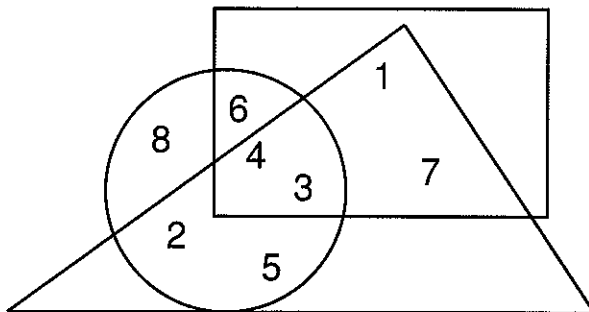
**Problem of the Day 67**

A small frog and a big toad are hopping up a stairway that has 30 steps. When the frog hops, it lands on every other step. When the toad hops, it lands on every fifth step. On which steps do both land?

---

**Problem of the Day 68**

Multiply all the numbers inside the triangle and the circle but *not* inside the rectangle.



---

**Problem of the Day 69**

Read the poem. Then tell what it means in your own words.

I hid my secret number  
Where no one else could see,  
Tho' doubled twice and twice again,  
There's nothing there for me!

---

**Problem of the Day 70**

Kenji is putting up a straight fence in his yard. He knows that he needs a fence post every 4 feet. If the fence is 32 feet long, how many posts will Kenji need for the fence?

---

**Problem of the Day 71**

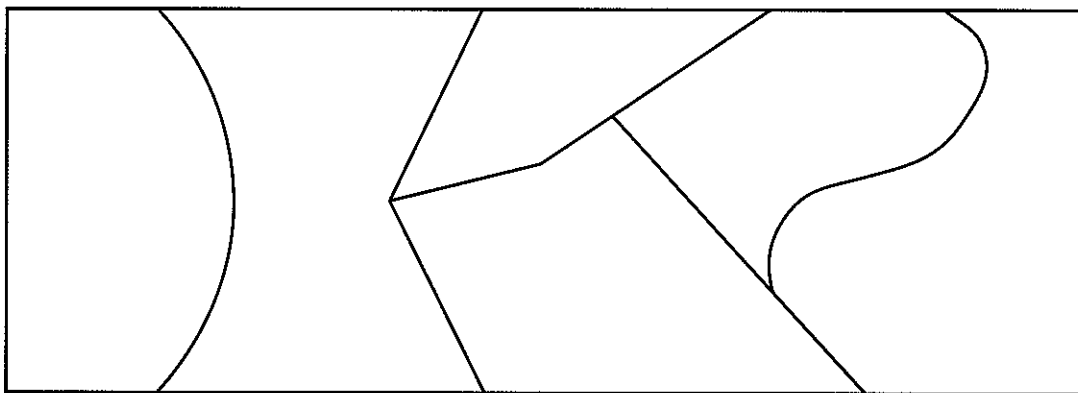
What is the pattern? Figure it out, then continue it three times.

ne, wo, ee, ur, ve, ix, ...

---

**Problem of the Day 72**

Use 11 counters. Put 1, 2, or 3 counters in each section. You may NOT put the same number of counters in sections that touch.

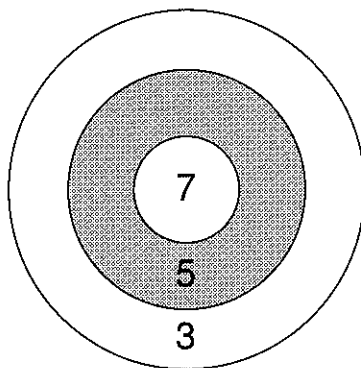


Copyright © Houghton Mifflin Company. All rights reserved.

---

**Problem of the Day 73**

Alex played darts on a board like this. In Round 1, he threw 5 darts to total 31 points. In Round 2, he got the same score with 5 darts but in another way. Where did his darts land in each round?



---

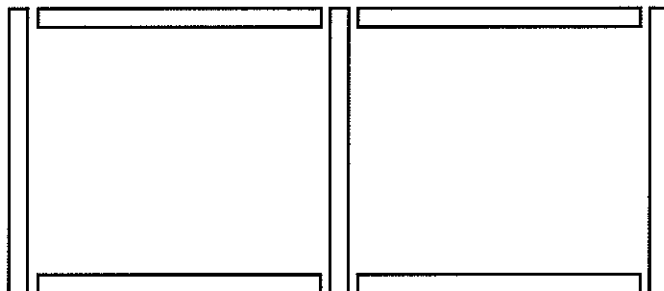
**Problem of the Day 74**

Three friends have birthdays in July. Donna's birthday is on the second 2-digit number of July. James's birthday is on the ninth odd number of July. The date of Laura's birthday is the difference between the other two dates. When is each friend's birthday?

---

**Problem of the Day 75**

Hal makes square wooden frames. He joins them to display photos that belong together. How many pieces of wood will he use to make 7 frames connected like this in one long arrangement?



---

**Problem of the Day 76**

How many 7's are used to number every page in a book that is 140 pages long?

---

### Problem of the Day 77

If you turn a calculator upside down, some numbers look like letters and words. For example, **7714** upside down looks like the word *hill*, and **5507** looks like the word *loss*. Make up one addition and one subtraction sentence in which the upside-down answers in the calculator display spell *soil*.

---

### Problem of the Day 78

Lily wants to call the state just south of her own state. She knows the phone number but not the area code. Lily's dad gives her these hints: The area code has three digits. It is the same backward or forward. The digits have a product of 64. Find the area code. Then use an almanac or phone directory to figure out where Lily lives.

---

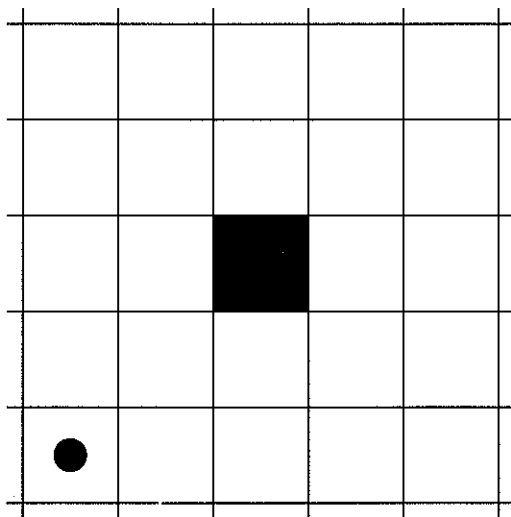
**Problem of the Day 79**

Get 27 counters. Divide them into three equal groups. Move exactly 6 counters to leave two groups of 6 and one group of 15.

---

**Problem of the Day 80**

How would you travel through the grid? You must start and end at the box with the dot. You may not go through the same box more than once, but you must pass through every box. The shaded box is a free space—go around it.





---

**Problem of the Day 81**

If you could choose, would you rather have 400 pennies, 40 dimes, 4 dollars, or 90 nickels? Explain.

---

**Problem of the Day 82**

On May 5, Opal starts reading a book with 90 pages. If she reads 9 pages every day, on what date will she finish the book?

---

**Problem of the Day 83**

Teri works in the cafeteria. She opened a can of olives and put 3 olives on each of a dozen trays. When she was done, she had 4 olives left over. How many olives were in the can?

---

**Problem of the Day 84**

On the day of her party, Nora's doorbell rang 6 times. One guest was at the door on the first ring. On each ring after that, Nora welcomed two more guests than she did the ring before. How many guests came to Nora's party?

---

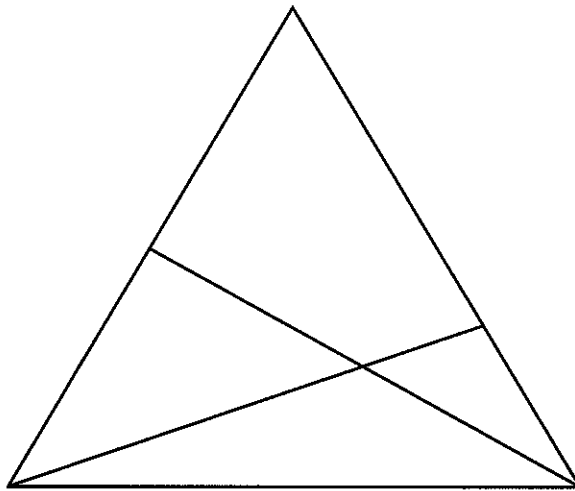
**Problem of the Day 85**

Which capital letters look exactly the same in a mirror?

---

**Problem of the Day 86**

How many triangles can you find in this figure?



---

**Problem of the Day 87**

In a go-cart show, carts roll past the judges along a 65-foot ramp. Rules say that there must be a 10-foot space between go-carts as they pass the judges. If a go-cart is 5 feet long, how many go-carts fit on the ramp at once?

---

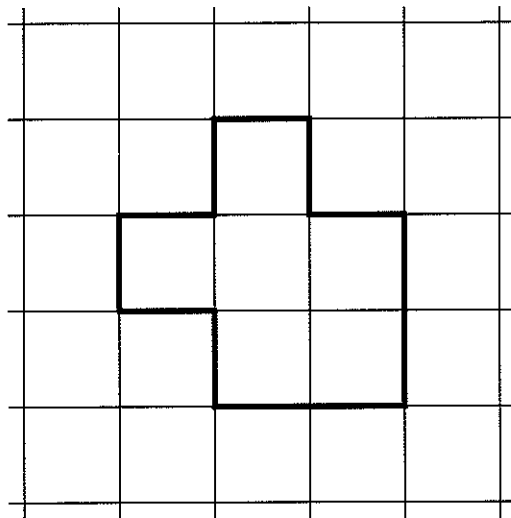
**Problem of the Day 88**

How many red right angles are there on an ordinary checkerboard? You may use a calculator to help you.

---

**Problem of the Day 89**

Along which grid lines could you cut the figure below to form two congruent parts?



---

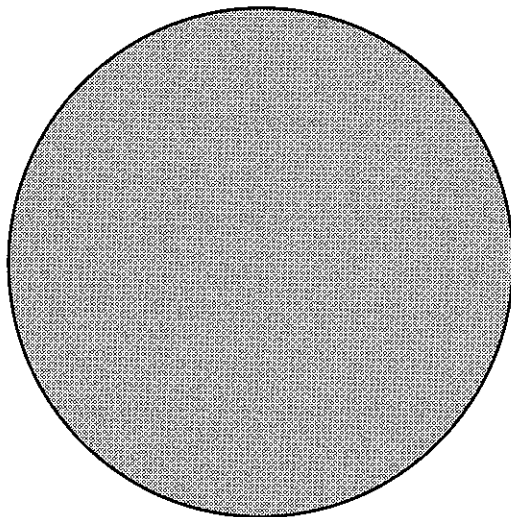
**Problem of the Day 90**

An ant, a moth, a beetle, a bee, and a fly walked up a log. The bee led the bug parade. The moth was in front of the fly. The ant was three bugs in back of the beetle. In what order did the bugs walk?

---

**Problem of the Day 91**

How can you cut a round pie into 7 pieces with 3 cuts? The pieces do not have to be the same size.



---

**Problem of the Day 92**

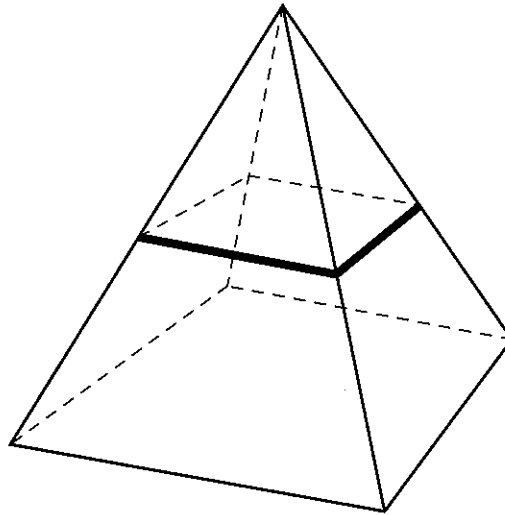
Each letter stands for a different number. A letter stands for the same number whenever it is used. Find numbers that will make the code work.

$$\begin{array}{r} \text{AM} \\ + \text{ME} \\ \hline \text{EEL} \end{array}$$

---

**Problem of the Day 93**

Kyra has a wooden box shaped like a pyramid. The top comes off at the heavy line. When the top is off, what shape is the opening?



---

**Problem of the Day 94**

Drivers pay 30-cent tolls to cross a bridge. Automatic machines count the coins that drivers drop in as they go by, but the machines will not accept pennies. How many different ways can drivers pay the exact toll *without* pennies?

---

**Problem of the Day 95**

During a normal school day, when do the minute and hour hands on a clock form a single straight line segment?

---

**Problem of the Day 96**

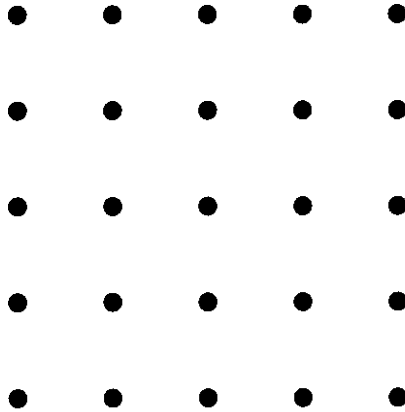
Chet, Maya, Hal, and Willa are the names of Victor's mom, dad, sister, and brother. Victor is older than Maya. Chet's dad has a grandson named Hal. How is each person related to Victor?



---

**Problem of the Day 97**

Make a triangle and a rectangle on a geoboard. The triangle must touch 8 pins, the rectangle must touch 6 pins, and both shapes must share 3 pins.



---

**Problem of the Day 98**

Pat, Zed, and Kim are all men. Pat is Zed's father. Zed is Kim's father. How is Pat related to Kim?

---

**Problem of the Day 99**

Betty, Jan, and Fred saved a total of \$12. Together, Fred and Betty saved as much as Jan saved by herself. Together, Jan and Betty have \$4 more than Fred. How much money did each person save?

---

**Problem of the Day 100**

It took Isaac the Inchworm 10 minutes to explore one face of a cube. Can Isaac explore all the faces of the cube in an hour? Explain your answer.

---

**Problem of the Day 101**

The Magicians Club bought five new magic wands. The total cost was \$12. Club members shared the cost equally. Every member gave at least a quarter but less than \$1. What is the greatest number of club members there could have been? The fewest?

---

**Problem of the Day 102**

Becky wrote each digit from 1 to 9 on a separate card. Then she made three piles of three cards each. The sums of the digits in the piles were 13, 15, and 17. What cards were in each pile?

---

**Problem of the Day 103**

Davida shared some raisins with her friends. First she gave 6 raisins to Will. Then she gave Patti half of what was left. Next, Bart got half the raisins that were left, plus 1 more. Davida ate the last 5 raisins herself. How many raisins did Davida start with?

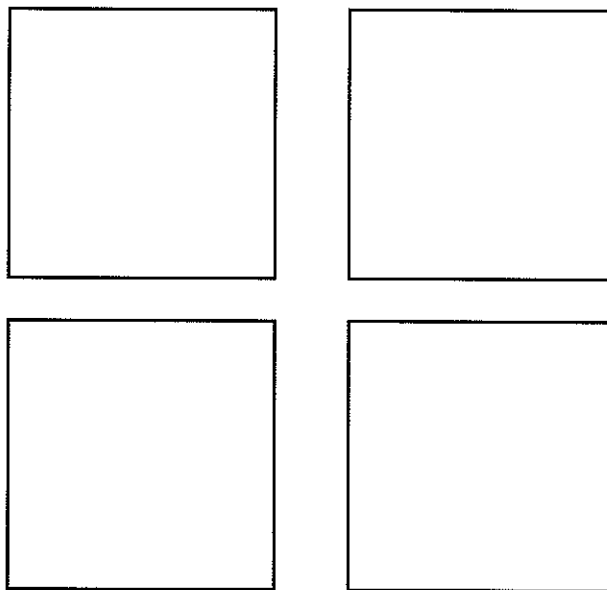
*Hint:* It is a multiple of 5.

---

**Problem of the Day 104**

Find four *different* ways to divide a square into fourths.

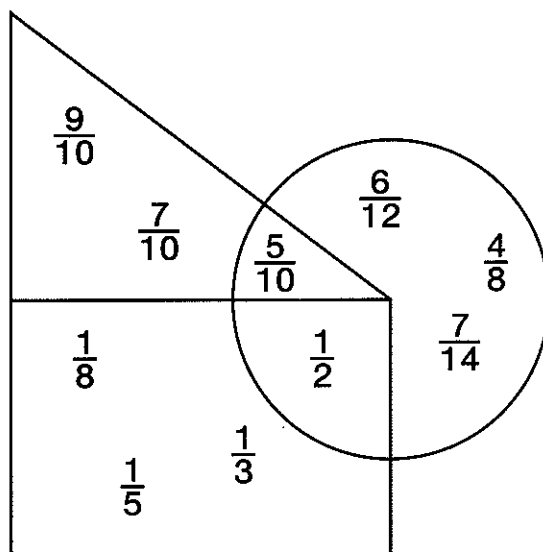
Draw your solution.



---

**Problem of the Day 105**

What is true about all the fractions inside the circle? Inside the triangle? Inside the rectangle? After you find out, write another fraction inside each shape.



---

**Problem of the Day 106**

Claude and Veronica plan to split a meatball sandwich. "I'm older, so I should get the bigger half," said Claude. "That's impossible," said Veronica. What could Veronica mean?

---

**Problem of the Day 107**

Use an almanac or atlas to solve the problem. Find the flags of the countries of Bahrain, Cuba, Japan, and Mongolia. Estimate how much of each flag is red.

---

**Problem of the Day 108**

What is the least number of times you could fold a sheet of paper to form 32 equal sections? Make a guess, then experiment to test your guess.

---

**Problem of the Day 109**

Use only the digits 1, 2, 3, and 4. Write all possible true statements that compare fractions in the form shown here.

$$\frac{\square}{\square} < \frac{\square}{\square}$$

---

**Problem of the Day 110**

Kendra will turn nine on May 15. If today is March 20, in how many days will she turn nine?

---

**Problem of the Day 111**

The square floor in Gino's kitchen is covered with 64 square tiles, all the same size. What fraction of the tiles are along the edges of the square? *Hint:* Draw a picture.

---

**Problem of the Day 112**

Find the pattern. Then give the three missing numbers.

1  
3 3  
5 6 5  
7 11 11 7  
9 18 \_\_\_\_

Copyright © Houghton Mifflin Company. All rights reserved.



---

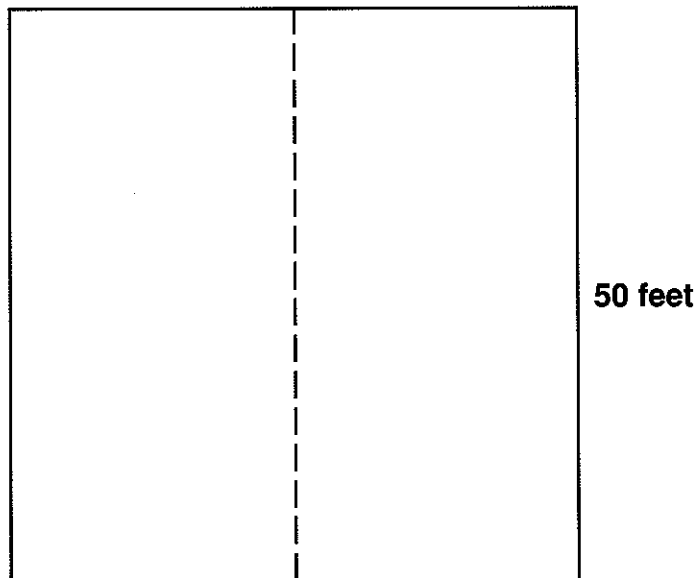
**Problem of the Day 113**

A peach and a pear cost 16¢. A plum and a peach cost 18¢. A plum and a pear cost 20¢. How much does each fruit cost?

---

**Problem of the Day 114**

A fence divides a square field in half. If the field is 50 feet long on a side, what is the perimeter of half the field?



---

**Problem of the Day 115**

A kindergarten class did a number parade at the Math Fair. Nine "digit guards" marched in a long row, each holding a giant number card from 1 to 9. Behind each digit guard were the number of marchers marked on the card. How many children were in the parade? How many children were behind the third digit guard, but before the sixth digit guard?

---

**Problem of the Day 116**

Reneé bought 4 kinds of drinks in 4 different-sized cartons. She got milk, cider, lemonade, and fruit punch. She got cup, pint, quart, and gallon cartons. Cider came in the largest carton. The lemonade carton was smaller than the punch carton but larger than the milk carton. Match each drink with the size of its carton.

---

**Problem of the Day 117**

A Square Dance Club has 5 boys and 4 girls. How many different boy-girl pairs can the dancers make?

---

**Problem of the Day 118**

A driveway is 50 feet long. The driveway starts and ends with red reflectors. Reflectors also appear every 10 feet along both sides of the driveway. How many reflectors are used in all?

---

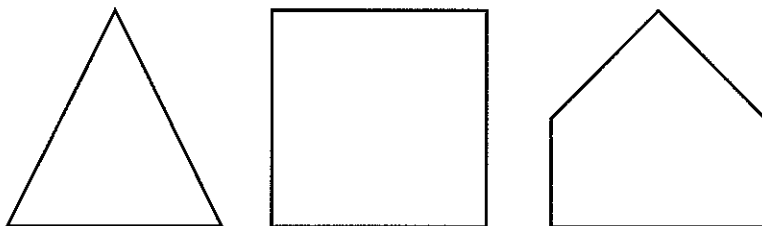
**Problem of the Day 119**

Timothy saw two toy dinosaurs he liked at a museum shop. The more expensive dinosaur cost 3 times as much as the other. Together, both dinosaur toys cost \$8. Find the price of each dinosaur.

---

**Problem of the Day 120**

Find the pattern. Then continue it twice more:



---

**Problem of the Day 121**

How many capital letters can you make from 3 toothpicks, using all 3 and not breaking any of them? Which letters can be formed?

---

**Problem of the Day 122**

A butcher uses a balance scale. He has only four weights: 1 kg, 2 kg, 4 kg, and 8 kg. What amounts of chopped meat can he measure using combinations of the weights? Explain.

---

**Problem of the Day 123**

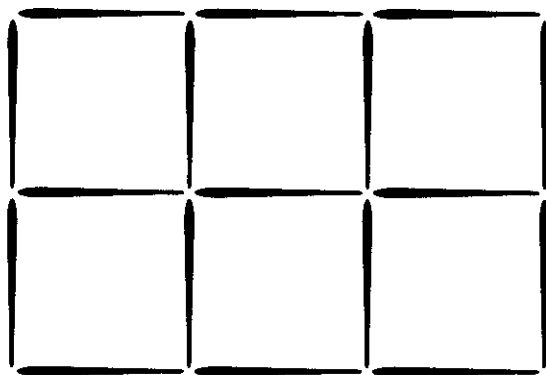
Look at the box below. How many different products are there if you can multiply any two numbers? You may repeat factors.

2	4	6	8
---	---	---	---

---

**Problem of the Day 124**

Take away 4 toothpicks to leave 3 squares.



---

**Problem of the Day 125**

Find every number between 10 and 100 whose digits add up to 10.

---

**Problem of the Day 126**

Between 1:30 P.M. and 8:20 P.M., how many times does the minute hand move past the 5?

---

**Problem of the Day 127**

One afternoon Hector said, "The number of hours that passed since noon are half as many as the number of hours that will pass from now to midnight." What time was it when Hector said this?

---

**Problem of the Day 128**

Alana was born on August 23. That year August had 5 Fridays. How many Tuesdays did that August have?



---

**Problem of the Day 129**

Find the date of the 100th day of a year that is not a leap year.

---

**Problem of the Day 130**

Each letter in the subtraction exercise stands for a different digit. A letter stands for the same digit every time it repeats. Can you crack the code?

$$\begin{array}{r} \text{FIVE} \\ - \text{FOUR} \\ \hline \text{ONE} \end{array}$$

---

**Problem of the Day 131**

Find two numbers whose sum is half their product.

---

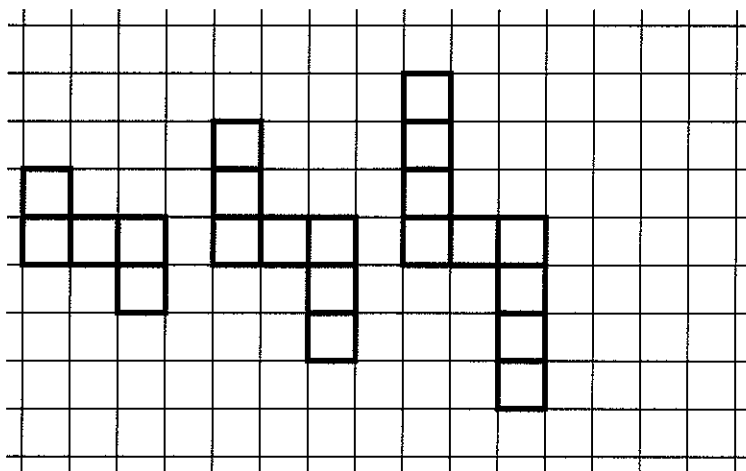
**Problem of the Day 132**

Suppose you wrote each decimal you would say to count by tenths from 0.4 to 3.5. How many times would you write the digit 2?

---

**Problem of the Day 133**

Look at the picture pattern. Draw the next figure. How many boxes would be in the next figure after that?



---

**Problem of the Day 134**

Len, Kay, Max, and Sara went to the zoo. They all drew pictures of their favorite animals. No one's favorite animal began with the same letter as his or her name. Sara drew a kangaroo. The others drew a lion, a monkey, or a seal when it was feeding time. Kay got wet when her favorite animal splashed too hard. Who drew which animal?

---

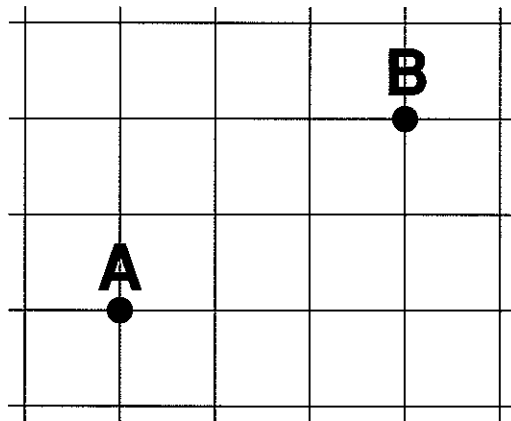
**Problem of the Day 135**

Use the digits 0, 2, 4, 6, and 8. You may repeat digits. You do not have to use all the digits. Write the following decimals: a decimal less than half, a decimal between 0.4 and 1, a decimal less than 3, and a decimal close to 5.

---

**Problem of the Day 136**

If you only move to the *right* and *up*, how many different paths can you find that join points A and B?



---

**Problem of the Day 137**

Find the smallest number you can add to 123 that will give a sum whose only digits are 2's.

---

**Problem of the Day 138**

If you use at least one of each United States coin—except for a dollar coin—which ten coins give you exactly \$1?

---

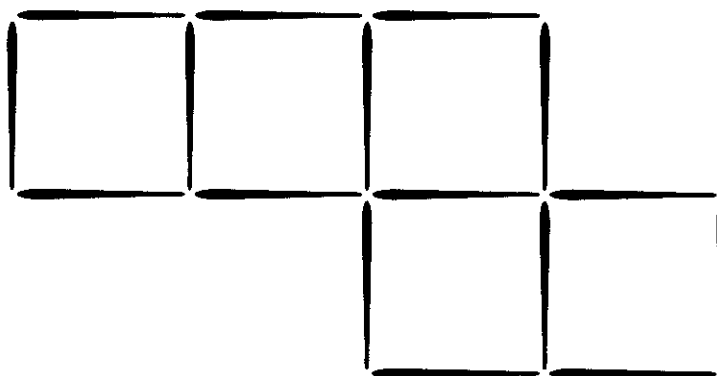
**Problem of the Day 139**

Find a decimal that is exactly halfway between 2.8 and 8.2.

---

**Problem of the Day 140**

The 16 toothpicks form 5 equal squares. Which 2 toothpicks could you remove to leave only 4 squares?



---

**Problem of the Day 141**

Theresa is making a chain using 10 large paper clips. Every paper clip is 5 centimeters long. She loses 0.1 centimeter of length every time she hooks two paper clips together. How long is Theresa's paper clip chain?

---

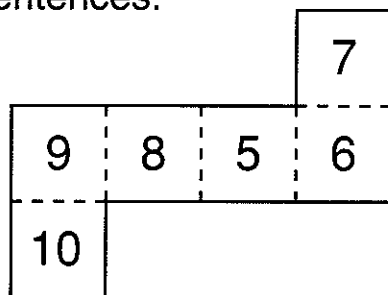
**Problem of the Day 142**

Margo, Nick, Omar, and Pam picked library books. They chose a joke book, a mystery, a biography, and a science book. For once, Nick is not reading about a president. Omar giggled as he picked his book. Margo loves to pretend she is a famous detective. Who chose which book?

---

**Problem of the Day 143**

Using the net shown below, make a cube. Then write three number sentences with factors and products. Use the pairs of numbers on opposite faces as the factors in the number sentences.



---

**Problem of the Day 144**

Simon has an  $8 \times 8$  grid to design. He plans to draw a red dot in every 4th box. He will make a border on every 8th box. How many boxes will be left plain?



---

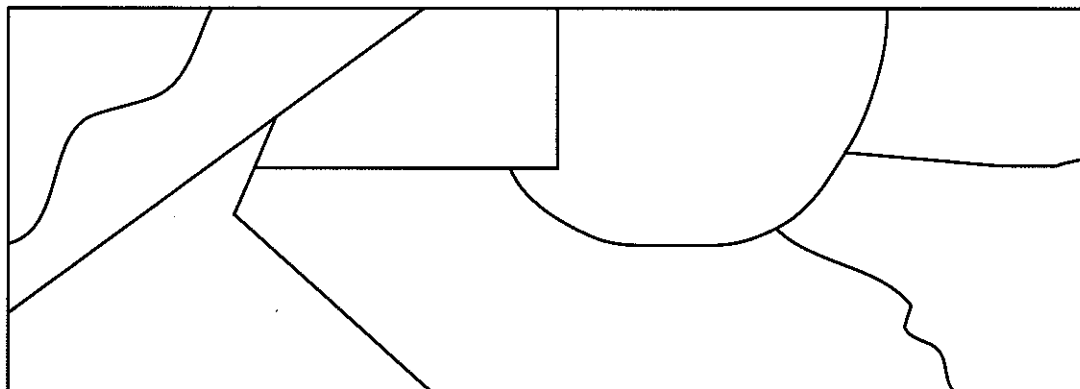
**Problem of the Day 145**

The **4** on Jeremy's calculator does not work. How could he use the broken calculator to find  $24 \times 14$ ? Explain your method.

---

**Problem of the Day 146**

Use 15 counters. Put 1, 2, or 3 counters in each section of the figure. You may NOT put the same number of counters in sections that touch.



---

**Problem of the Day 147**

One of the numbers in the box does not belong. Why?

3515	428	6742	
8324	339	707	800

---

**Problem of the Day 148**

Olivia is playing a word game. She can use the letters A, T, and N. In how many different ways can she arrange her letters?  
Which arrangements form real words?

---

**Problem of the Day 149**

Aaron's telephone number starts with an 8 and ends with a 6. It has three 3's in it. It also has one other odd and one other even number. All seven digits in his phone number add up to 30. What might Aaron's phone number be?

---

**Problem of the Day 150**

Jamaal has 5 coins. He has twice as many dimes as quarters. He has half as many quarters as nickels. How much money does he have?

---

**Problem of the Day 151**

Oliver is playing a word game. He arranges the letters *T*, *M*, *E*, and *A* in any order. What real words can he form?

---

**Problem of the Day 152**

Put a plus sign somewhere to form an addition sentence that has a sum of 466.

4 1 4 2 5

---

**Problem of the Day 153**

A hotel has 26 rooms on each floor. Odd-numbered rooms are across the hall from even-numbered rooms. The numbers on the top floor begin with 901. What is the number of the room in the middle of the even-numbered side of the hall on the top floor?

---

**Problem of the Day 154**

Eric has a penny, a nickel, a dime, a quarter, and a half-dollar in his pocket. Find every possible price of items he could buy using *two* coins, without needing to get back change.

---

**Problem of the Day 155**

The ancient Maya Indians of Mexico had their own way to show numbers. Here are three Mayan numbers. Find a pattern. Then use the patterns to write the numbers 2, 8, 11, and 19 the Maya way.

3  
• • •

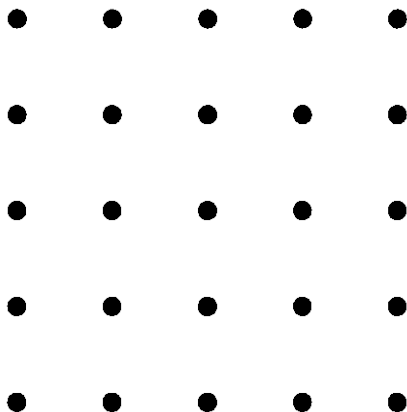
7  
• •  
\_\_\_\_\_

15  
=====

---

**Problem of the Day 156**

Use one geoboard and two rubber bands. Make a rectangle that touches 8 pins and a triangle that touches 6 pins, but let both figures touch only 1 pin together.



---

**Problem of the Day 157**

The math machine takes a number in, changes it, then sends out a new number. Figure out how the numbers below were changed. Tell the rule, then give the four missing numbers.

In	Out
1	5
2	8
3	11
4	14
5	
8	
10	
33	

---

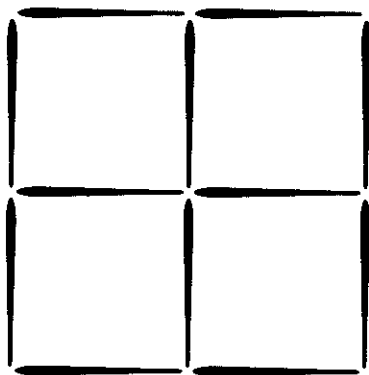
**Problem of the Day 158**

There are five cousins in the Jones family. Every year each cousin makes a birthday card for every other cousin. For each cousin's birthday, the four other cousins chip in for a gift. In a year how many cards and gifts do the Jones cousins give?

---

### Problem of the Day 159

Move only two toothpicks to form seven squares.



---

### Problem of the Day 160

In a magic square, every column, row, and diagonal has the same sum. Use the numbers 3 through 11 *once* each so that the magic square sum is 21.

5		



- 1 1961 [Suggest students use number sense. 19 read upside down is 61.]
- 2 Some possible answers:  $10 > 2$ ,  $12 > 0$ ,  $21 > 0$ ,  $1 < 20$ ,  $0 < 12$
- 3 One possible answer is shown below.

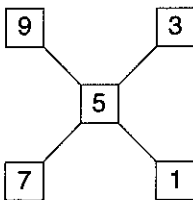
gray	tan	red	pink
tan	red	pink	gray
red	pink	gray	tan
pink	gray	tan	red

[Suggest students act it out by arranging slips of paper labeled with colors.]

- 4 Zena made \$20.  
[Together she spends  $\$30 + \$50 = \$80$ . She takes in  $\$40 + \$60 = \$100$ . Since  $\$100 - \$80 = \$20$ , she made \$20.]
- 5 Take away the bottom toothpick in the middle square of the bottom row.
- 6 9 burgers [Suggest students make a chart to complete the pattern.]

Burger	1	2	3	4	5	6	7	8	9
Price	35¢	55¢	75¢	95¢	\$1.15	\$1.35	\$1.55	\$1.75	\$1.95

- 7 She has 1 dime and 1 penny. *One* of the coins is not a penny, but the *other* one is!
- 8 One possible answer is shown.



[Note that the sum of the three middle numbers—3, 5, 7—is 15. Place these numbers in order along a diagonal. The remaining numbers—1 and 9—can then be easily placed.]

- 9 10 shells [Start with 11 shells. Give away 5 shells. Have 6 shells now. Trade 1 shell. Have 5 shells now. Get 5 shells. Have 10 shells now.]
- 10 8 children on swings, 4 children playing Frisbee [Look for two addends of 12 such that one addend is twice the other.]

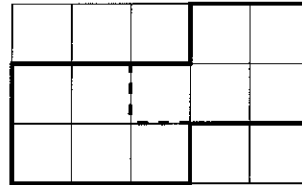
- 11 Dilly, Clara, Fleegle, Blippo, Elmo  
[Dilly was first. Blippo was between Elmo and Fleegle who was behind Clara. So Clara was second, Fleegle was third, Blippo was fourth, and Elmo was fifth.]

- 12 Brian has read 11 pages, 1 more page than Debra. [Brian has read 11 pages: 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, and 15.]

- 13 One possible answer:  
Enter  $234 + 1 - 198$ .  
[Suggest students consider that  $235 = 234 + 1 = 236 - 1 = 233 + 2 = 237 - 2$ , and so on.]

- 14 One possible answer:  $\# = 2$ ,  $* = 4$ ,  $! = 6$   
[Pick any value for  $\#$ . Double it for  $*$ , triple it for  $!$ .]

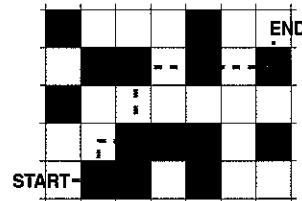
- 15 Dotted lines show answer.



[The area of the figure is 10 square units. The pieces must each have an area of 5 square units.]

- 16 8 triangles [Students may need help in identifying overlapping triangles. Suggest they label the corners and list all the triangles. For example, if the outside triangle is labeled counter-clockwise  $ABC$ , with point  $D$  on side  $AC$  and point  $E$  on segment  $BD$ , the triangles are  $ABC$ ,  $AEC$ ,  $ABD$ ,  $ABE$ ,  $ADE$ ,  $BDC$ ,  $BEC$ ,  $EDC$ ]

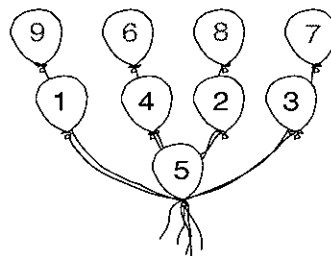
- 17 One possible answer is shown in the maze below.



## Solution Key

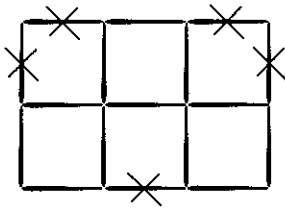
- 18 Some possible answers: 111, 212, 102, and so on. [There are only 2 choices for the first digit: 1 and 2. There are 3 choices for each of the remaining digits. There are 18 possible numbers. Suggest students start an organized list: 100, 101, 102, 110, 111, 112, 120, 121, 122, 200, 201, 202, 210, 211, 212, 220, 221, 222.]
- 19 diamond or square, depending on the kind of triangle cut [Suggest students act it out.]
- 20 12:59; 9:59; 10:00; 1:00
- 21 Taylor, Cooper, Tinker, Weaver [Suggest students label a number-line diagram. Since Baker is the farthest west, Weaver is 10 miles east of Baker and Taylor is 10 miles east of Weaver. Cooper and Tinker are both between Taylor and Weaver, with Cooper east of Tinker. So reading from east to west the towns are Taylor, Cooper, Tinker, Weaver.]
- 22 about 180 feet, about 90 feet  
[ $2 \times 90 = 180$ ;  $180 \div 2 = 90$ ]
- 23 15, 16, 17, 18, 19, 20, 21, 22, 23, 24  
[Answers depend on how students round.]
- 24 60 legs [Each horse has 4 legs.  
 $10 \times 4 = 40$ . Each rider has 2 legs.  
 $10 \times 2 = 20$ ;  $40 + 20 = 60$ ]
- 25 Estimates may vary; about 13¢  
[Students could act it out. If students stack "heads" facing "heads," they will find that fewer coins are needed for the stack.]
- 26 At most, he could have 1 quarter and 5 dimes, or 75¢; he can take at most 7 turns.
- 27 \$3.25 [Heather paid \$3.15.]
- 28 Move 1 penny and 1 quarter from purse A to purse B to give both purses \$1.26. [Consider that purse A had a value of \$1.52 while purse B had a value of \$1.00.  $\$1.52 - \$1.00 = \$.52$ . Since the purses have to hold the same amount of money, purse A needs to lose  $\$.52 \div 2 = \$.26$  while purse B gains \$.26.]

- 29 First, move 2 groups of 2 to the box; next, move 1 group of 3 from the box back to the circle; finally, move 3 groups of 2 to the box.
- 30 7:05 [Suggest students use a mirror to draw the "mirror-image" to find the real time.]
- 31 24 times; 24 times [From noon on Sunday to noon on Monday is 24 hours. The minute hand points to the 3 at 15 minutes past the hour; the minute hand points to the 4 at 20 minutes past the hour.]
- 32 There are 12 stickers in a dozen, no matter how much they cost apiece.
- 33 26 [One pattern involves skip-counting differences:  $5 - 2 = 3$ ;  $10 - 5 = 5$ ,  $17 - 10 = 7$ . So the next difference will be 9.  $17 + 9 = 26$ .]
- 34 One possible answer is shown.



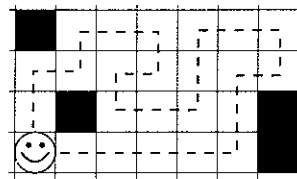
- [The bottom balloon is attached to all the other strings. If you place a 5 in the bottom balloon as shown, the sum along each string is 15. Another answer: Place a 1 in the bottom balloon; then, you can place the remaining digits in this order: 2, 5, 3, 4. The sum along each string is 12.]
- 35 Students may select  $28 + 52 = 80$ , but  $34 + 47 = 81$  or  $34 + 52 = 86$  are also appropriate because they provide Ford with extra marbles if needed.
- 36 5 quarters [Suggest students estimate, not add. It will take 2 quarters to buy a pen, 2 quarters to buy a pad, and 1 quarter to buy an eraser.]

- 37** \$7.50 [50 pennies + 40 nickels + 50 dimes =  $50¢ + 200¢ + 500¢ = 750¢$ ]
- 38** 6: Ann-Bo-Carl, Ann-Carl-Bo, Bo-Ann-Carl, Bo-Carl-Ann, Carl-Ann-Bo, Carl-Bo-Ann [Suggest that students make a list to solve the problem.]
- 39** 28 and 29 [Since the numbers are consecutive, consider that they are about halfway from 1 to 57.]
- 40** One possible answer is indicated by x's.



- 41**  $648 - 279$  [Suggest students use operation sense.]
- 42** Aaron with Diane, Bill with Caryn [Consider that Aaron cannot be Caryn's partner because their names rhyme. Caryn cannot be Diane's partner because the girls were not partners. So Bill is the only partner that Caryn can have. This leaves Aaron and Diane as partners.]
- 43** \$8 and \$12 [Consider that both hats cost the same price  $\$10 + \$10 = \$20$ . Then, continue a pattern to find a pair of addends that equal 20 but have a difference of 4. For example:  
 $\$9 + \$11 = \$20$  (difference = \$2)  
 $\$8 + \$12 = \$20$  (difference = \$4)  
 $\$7 + \$13 = \$20$  (difference = \$6)]
- 44** 5 ways: 1 quarter, 1 nickel; 2 dimes, 2 nickels; 1 dime, 4 nickels; 3 dimes; or 6 nickels [Suggest that students make a list to help them solve the problem.]
- 45** a.  $864 + 753 = 1617$   
 or  $863 + 754 = 1617$   
 or  $854 + 763 = 1617$   
 b.  $876 - 345 = 531$

- 46** The dotted line shows one possible answer.



- 47** 7 moves [The puzzle does not restrict the number or color of counters you can jump. One solution follows.]

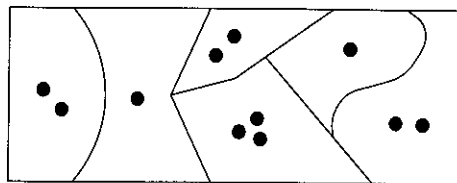
Move 1: Y Y Y ☐ R R R  
 Move 2: Y Y ☐ Y R R R  
 Move 3: Y Y R Y ☐ R R  
 Move 4: Y ☐ R Y Y R R  
 Move 5: Y R R Y Y ☐ R  
 Move 6: ☐ R R Y Y Y R  
 Move 7: R R R Y Y Y ☐  
 R R R ☐ Y Y Y

- 48** Uri has 33 votes, which is more than the number of classmates interviewed. People may have voted twice, or Uri may have made an error in recording data.
- 49** sometime between 5:00 P.M. and 6:00 P.M. [Each hour, the net distance that the caterpillar moves is 3 feet. By 5:00 P.M., the caterpillar is at the 15-foot point of the well. Since  $15 + 4 = 19$ , the caterpillar will have gotten out of the well before 6:00 P.M.]
- 50** 21 balloons [ $3 + 10 + 8 = 21$ . The information about bursting balloons is extra information.]
- 51** labels, from top to bottom: apples, bananas, grapes, watermelon, pineapple [Grapes (the least) got 3 votes. Watermelon has 4 syllables so it got 4 votes. Look at the remaining votes for apple-banana possibilities. Since  $6 + 4 = 10$ , apples got 6 votes while bananas got 10 votes. Pineapple got 5 votes.]
- 52** 14 squares [Some students may need help in visualizing the overlapping squares. There is 1 square with area 9, 4 squares with area 4, and 9 squares with area 1.  $1 + 4 + 9 = 14$ ]

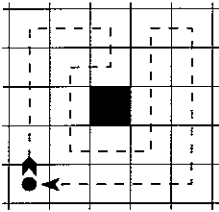
## Solution Key

- 53 No, but he can at 12:15 P.M.  
[ $75 - 57 = 18$ ; 18 quarter-hours = 4 hours 2 quarter-hours = 4 hours 30 minutes; 4 hours 30 minutes later than 7:45 A.M. is 12:15 P.M.]
- 54 "All but 4" means the gorilla did eat 8 bananas but did *not* eat 4, so she sees 4 bananas.
- 55 No, there are 4 ways for Lori to win (3, 4, 5, 6) but only 2 ways for Benito to win (1, 2).
- 56 It is harder to pick the correct first because there is only 1 chance out of 8 of getting it right; there is 1 chance out of 4 of picking the right person.
- 57 One possible answer: Pia, because she has the shortest name. Things might change if Elizabeth writes *Liz* or if they also include last names.
- 58 Predictions will vary; for the number words *one* through *eleven*, Bradley will write 20 vowels and 25 consonants.
- 59 64 dolls [ $1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 = 64$ ]
- 60 32 pinecones [Each of the 4 students has 2 hands. Each hand is holding 2 bags. Each bag has 2 pinecones.  $4 \times 2 = 8$ ;  $8 \times 2 = 16$ ;  $16 \times 2 = 32$ ]
- 61 One possible answer: Ted is 3, Ned is 5. [Any two consecutive odd numbers greater than 1 is a solution. The sum of two odd numbers is an even number. The product of two odd numbers is an odd number.]
- 62 6 ways: 2 teams of 12, 3 teams of 8, 4 teams of 6, 6 teams of 4, 8 teams of 3, 12 teams of 2 [Suggest that students use counters to act out the problem.]
- 63 25 [Half of 200 is 100. Half of 100 is 50. Half of 50 is 25.]
- 64 2 ants, 3 spiders [Students might make a list of possibilities and check the total number of legs.]

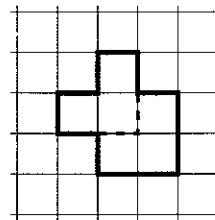
- 65 One possible answer: Put holes in the crate—removing some wood will make it weigh less.
- 66 \$17 [Get cards 5, 10, 15, and 20 free.  $\$21 - \$4 = \$17$ ]
- 67 steps 10, 20, and 30 [Suggest that students draw a diagram to help them solve the problem.]
- 68  $2 \times 5 = 10$
- 69 The secret number is 0. If you double 0, which means the same as multiplying  $0 \times 2$ , the answer is 0.
- 70 9 fence posts [You need a fence post at the beginning of the fence, then one every four feet.  $32 \div 4 = 8$ ;  $1 + 8 = 9$ ]
- 71 Pattern: last two letters of the counting numbers one, two, three, four, five, six; en, ht, ne [seven, eight, nine]
- 72 One possible answer is shown.



- 73 three 7's, two 5's; four 7's, one 3  
[If all five darts landed in the center, you would have 35 points, not 31 points. If four darts landed in the center, you would use four darts to score 28 points, leaving one dart to score  $31 - 28$ , or 3, points. One solution is four 7's, one 3. If 3 darts landed in the center, you would use 3 darts to score 21 points, leaving 2 darts to score  $31 - 21$ , or 10 points. Another solution is three 7's, two 5's. If two darts landed in the center you would use two darts to score 14 points leaving 3 darts to score  $31 - 14$ , or 17, points. Impossible. Similarly, if one dart landed in the center, you would use 1 dart to score 7 points, leaving 4 darts to score  $31 - 7$ , or 24, points. Impossible.]

- 74** Donna—July 11, James—July 17, Laura—July 6 [The second two-digit number is 11. The ninth odd number is 17.  $17 - 11 = 6$ ]
- 75** 22 pieces [The first frame takes 4 pieces. Each of the remaining 6 frames needs 3 pieces.  
 $4 + (6 \times 3) = 4 + 18 = 22$ ]
- 76** 24 sevens [7, 17, 27, 37, 47, 57, 67, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 87, 97, 107, 117, 127, 137. Remember the number 77 uses 2 sevens!]
- 77** The number 7105 looks like SOIL on a calculator. One possible answer:  
 $3000 + 4105 = 7105$ ;  
 $9110 - 2005 = 7105$
- 78** The area code 818 is in California, so Lily lives in Oregon. [Suggest students consider that the product of the digits is 64. There are two possible area codes to check: 444 and 818. Currently 444 is not being used as an area code anywhere in the United States or Canada. So the area code must be 818.]
- 79** Start with 9 counters in each group. Move 3 counters from two of the groups to the third group, leaving two groups of 6 and one group of 15. [Suggest students act it out using counters.]
- 80** One possible answer is shown.
- 
- [Suggest students make practice grids out of centimeter squared paper.]
- 81** The sets of pennies, dimes, and dollars are worth \$4 each, but the nickels are worth \$4.50, so take the nickels.
- 82** May 14 [It takes 10 days to read the book. The 10 days are May 5, 6, 7, 8, 9, 10, 11, 12, 13, and 14.]

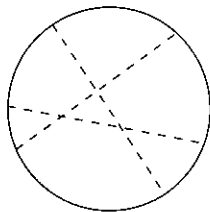
- 83** 40 olives [ $3 \times 12 = 36$ ;  $36 + 4 = 40$ ]
- 84** 36 guests [ $1 + 3 + 5 + 7 + 9 + 11 = 36$ ]
- 85** A, H, I, M, O, T, U, V, W, X, Y  
 [Letters with vertical lines of symmetry will look the same in a mirror.]
- 86** 8 triangles [Students may have trouble visualizing the overlapping triangles. Suggest they label the points of the figure using letters. Then, they can list triangles as they find them. For example, if the figure was labeled clockwise as ABCDE with a center point of F, the triangles would be ACD, ABD, AEC, CED, CBD, CFD, BFC, and EFD.]
- 87** 5 go-carts [Suggest students label a number line by 5's from 0 to 65, then consider jumps on a number line. Place one cart at the front of the ramp. This leaves  $65 - 5 = 60$  feet of ramp. From the end of one cart to the end of the next cart is 15 feet. Since  $60 \div 15 = 4$ , you can position 4 more carts on the ramp.  $1 + 4 = 5$ ]
- 88** 32 red squares  $\times$  4 right angles in each square = 128 right angles
- 89** The total figure has an area of 6 square units. Each of the congruent parts must have an area of 3 square units. If you can only cut on grid lines there is only one possible answer:



- 90** bee, beetle, moth, fly, ant [Since the bee is first, the ant must be in the fifth position with the beetle second. Since the moth was ahead of the fly, it must be third and the fly fourth.]

## Solution Key

- 91 One possible answer is shown.



[Since the figures do not all have to be the same size or shape, the 3 cuts do not have to intersect in one point.]

- 92 One possible answer:  $38 + 81 = 119$   
[Suggest that students use number and operation sense. Since the sum of the 2 two-digit numbers is a three-digit number, E must be 1 and the sum of A and M must be 11. The other possible solutions are  $47 + 71 = 118$ ;  $56 + 61 = 117$ ;  $74 + 41 = 115$ ;  $83 + 31 = 114$ ;  $92 + 21 = 113$ .]

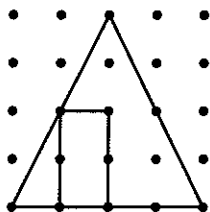
- 93 square or rectangle, depending on the base of the pyramid

- 94 5 ways: 1 quarter and 1 nickel, 3 dimes, 2 dimes and 2 nickels, 1 dime and 4 nickels, 6 nickels

- 95 Possible answers will vary: 8:11 A.M., 9:16 A.M., 10:22 A.M., 12:33 P.M., 1:38 P.M., 2:44 P.M., 3:49 P.M. Note: These times are to the nearest minute. [Suggest students position the hands on a watch or alarm clock.]

- 96 Willa and Chet are Victor's mom and dad. Maya and Hal are Victor's sister and brother. [Hal must be Chet's son. So Hal is Victor's brother and Chet is their father. Maya must be his younger sister and Willa must be his mother.]

- 97 One possible answer is shown.



[Suggest students use a geoboard and rubber bands to act out the problem.]

- 98 Pat is Kim's grandfather. [Pat is Kim's father's father.]

- 99 Betty saved \$2, Fred saved \$4, and Jan saved \$6. [Let  $J$  stand for Jan's amount,  $F$  stand for Fred's amount, and  $B$  stand for Betty's amount. Since  $F + B = J$ , Jan saved half of the total amount, or \$6. Since  $F + B = \$6 = J$ , and  $J + B = F + \$4$ ,  $F + B + B = F + \$4$ . So  $2B = \$4$ , and  $B = \$2$ . Betty saved \$2. Since  $F + B = \$6$ ,  $F = \$6 - \$2 = \$4$ . Fred saved \$4.]

- 100 Yes; a cube has 6 faces, and  $6 \times 10 = 60$  minutes, which is the same as one hour.

- 101 most—48 members paid 25¢;  
fewest—15 members paid 80¢  
[To find the greatest number, assume everybody paid the least amount.  
 $1200¢ \div 25¢ = 48$

Since the cost per member was less than \$1, there are more than 12 members. If you assume that sharing the \$12 cost equally means that each member has to pay the same amount of money with no extra money left over, then, you need to find the least number greater than 12 that divides 1200 evenly with no remainder, which is 15.  $1200 \div 15 = 80$ . Each of the 15 members pays 80¢. If you assume that there can be money left over, then, the least number of members would be  $12 + 1 = 13$ . Since  $1200 \div 13 = 92 \text{ R}4$ , each person pays 92¢ with 4¢ left over.]

- 102 One possible answer:

$$1 + 4 + 8 = 13,$$

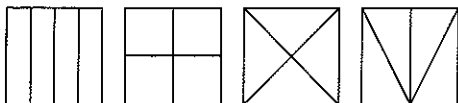
$$3 + 5 + 7 = 15,$$

$$2 + 6 + 9 = 17$$

[Suggest that students list the numbers 1, 2, 3, 4, 5, 6, 7, 8, 9 and look for patterns. Another answer:  $1 + 7 + 9 = 17$ ,  $2 + 3 + 8 = 13$ , and  $4 + 5 + 6 = 15$ .]

- 103 30 raisins [Guess and check using multiples of 5, or work backward. Bart got  $\frac{1}{2}$  of the remaining raisins plus 1 more. He got 7 raisins. Before Bart, there were  $2 \times 6 = 12$  raisins. Patti got 12 raisins. Before Patti, there were  $2 \times 12 = 24$  raisins. Will got 6 raisins. Before Will, there were  $24 + 6$ , or 30 raisins.]

- 104 Possible answers are shown.



[Remind students that the dividing lines do not always have to be straight. Students might consider curved, wavy, or zigzag lines too. They can check their answers by using tracings.]

- 105 Circle fractions are equivalent to  $\frac{1}{2}$  and have denominators that are multiples of 2; triangle fractions have a denominator of 10 and numerators that are odd numbers; rectangle fractions have numerators of 1. One possible set of other fractions is  $\frac{3}{6}, \frac{3}{10}, \frac{1}{7}$ .

- 106 *Half* means two equal parts. If the sandwich is split exactly in half, both parts must be the same size. But in situations like this, we use *half* if the parts are close to the same size.

- 107 Estimates may vary; Bahrain— $\frac{3}{4}$ ; Cuba— $\frac{1}{4}$ ; Japan— $\frac{1}{3}$ ; Mongolia— $\frac{2}{3}$ .

- 108 5 times [first fold: 2 pieces; second fold:  $2 \times 2 = 4$  pieces; third fold:  $4 \times 2 = 8$  pieces; fourth fold:  $8 \times 2 = 16$  pieces; fifth fold:  $16 \times 2 = 32$  pieces]

- 109  $\frac{1}{2} < \frac{3}{4}, \frac{1}{3} < \frac{2}{4}, \frac{1}{4} < \frac{2}{3}$  [Some students may also write solutions such as  $\frac{2}{3} < \frac{4}{4}$  or  $\frac{3}{4} < \frac{2}{1}$  or  $\frac{3}{2} < \frac{4}{1}$  or  $\frac{4}{2} < \frac{3}{1}$ .]

- 110 56 days [11 days left in March, 30 days in April, 15 days in May;  $11 + 30 + 15 = 56$ ]

- 111  $\frac{28}{64}$  or  $\frac{7}{16}$  [The floor is a square that has 8 tiles on each side. Remember the corner squares belong to 2 sides of the square. The number of squares along the outer edge =  $8 + 7 + 7 + 6 = 28$ .]

- 112 22, 18, 9 [The outside numbers are the odd numbers. Place the number 9 in the rightmost blank. Each inside number is the sum of the two numbers above it, for example,  $6 = 3 + 3$ ,  $11 = 5 + 6$ .  $11 + 11 = 22$  and  $11 + 7 = 18$ ]

- 113 pear—9¢, peach—7¢, plum—11¢ [A peach and a pear cost 16¢ and a peach and a plum cost 18¢, since a plum

costs 2¢ more than a pear. A plum and a pear cost 20¢ so a plum is 11¢ and the pear is 9¢.

- 114 150 feet [50 feet  $\div 2 = 25$  feet; The sides of each rectangle are 50 feet, 25 feet, 50 feet, and 25 feet.  $50 + 25 + 50 + 25 = 150$ ]

- 115 Total number: 54  
[ $1 + 2 + 3 + 4 + 5 + 6 + 7 + 8 + 9 = 45$ ;  
45 marchers plus 9 digit guards = 54];  
14 children [3 + 4 + 5 = 12 marchers,  
plus the 2 digit guards for the numbers 4  
and 5]

- 116 cup of milk, pint of lemonade, quart of punch, gallon of cider [Largest container is the gallon. Since cup < pint < quart and milk carton < lemonade carton < punch carton, milk is in the cup carton, lemonade is the pint carton, and punch is in the quart carton.]

- 117 20 pairs [For each of the 5 boys, there are 4 possible partners.  $5 \times 4 = 20$ ]

- 118 12 reflectors [Each side of the driveway has  $1 + 5 = 6$  reflectors.]

- 119 \$2 and \$6 [Students need to look for two numbers whose sum is 8. List pairs of addends: 1 + 7, 2 + 6, 3 + 5, 4 + 4. One addend must be three times the other. Since  $6 = 3 \times 2$ , 2 + 6 is the correct addend pair.]

- 120 Pattern: 3-sided figure, 4-sided figure, 5-sided figure. The next two figures should have 6 and 7 sides respectively.



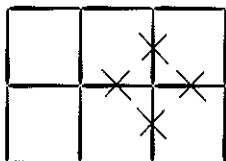
- 121 15 letters: A, C, D, F, H, I, J, K, N, P, T, U, Y, Z; some students may also include S.

- 122 Consider that  $1 + 2 = 3$ ,  $1 + 4 = 5$ ,  $2 + 4 = 6$ ,  $1 + 2 + 4 = 7$ ,  $8 + 1 = 9$ ,  $8 + 2 = 10$ , and so on. By combining weights, he can measure every whole number weight from 1 kg through 15 kg. To weigh amounts greater than 15 kg, he can weigh batches of 15 kg, remove the meat from the scale, then measure the remaining.

## Solution Key

- 123** 9 products  
[The products are  $4 = 2 \times 2$ ,  $8 = 2 \times 4$ ,  
 $12 = 2 \times 6$ ,  $16 = 2 \times 8 = 4 \times 4$ ,  
 $24 = 4 \times 6$ ,  $32 = 4 \times 8$ ,  $36 = 6 \times 6$ ,  
 $48 = 6 \times 8$ , and  $64 = 8 \times 8$ .]

- 124** One possible answer is shown.



- 125** 19, 28, 37, 46, 55, 64, 73, 82, 91  
[Use number sense. Consider two addends whose sum is 10.]

- 126** 6 times [Students could act it out by turning the hands on a wind-up clock. About 2:25, 3:25, 4:25, 5:25, 6:25, and 7:25]

- 127** 4:00 P.M. [The total time elapsed is from 12 noon to 12 midnight, which is 12 hours. You need to find two numbers that add up to 12 hours, yet one is half the value of the other. For example, try 2 hours + 10 hours. 2 is not half of 10. Continue guessing and checking until you find the correct combination of numbers.  $4 + 8 = 12$ ; 4 is half the value of 8, so the answer is 4:00 P.M.]

- 128** 4 Tuesdays [August has 31 days. August has 5 Fridays when the first of August falls on a Thursday or a Friday. Since Thursday and Friday are after Tuesday, there can only be 4 Tuesdays. The information about Alana is extra information.]

- 129** April 10 [January and March have 31 days. February has 28 days.  $31 + 28 + 31 = 90$ . Since  $100 - 90 = 10$ , the 100th day is April 10.]

- 130** One possible answer:  
 $9856 - 9430 = 426$   
[Suggest students list the digits 0–9, then cross off digits as they are assigned. There are many possible answers. Consider that R must be 0. When O is 2, I is 4 or 5, when O is 3, I is 6 or 7, and when O is 4, I is 8 or 9.

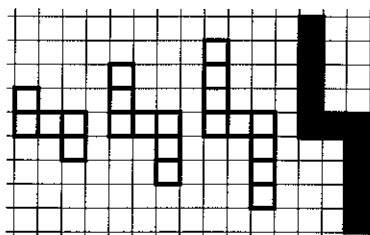
Some other answers include  
 $1543 - 1260 = 283$ ,  $5491 - 5230 = 261$ ,  
 $8679 - 8320 = 359$ ,  $8729 - 8370 = 359$ ,  
 $2863 - 2450 = 413$ , and  $7936 - 7480 = 456$

- 131** Possible answers include  
 $3 + 6 = 9$  and  $3 \times 6 = 18$ ,  
 $4 + 4 = 8$  and  $4 \times 4 = 16$

[Suggest students use Guess and Check.]

- 132** 13 times [1.2, 2.0, 2.1, 2.2, 2.3, 2.4, 2.5, 2.6, 2.7, 2.8, 2.9, 3.2]

- 133** 13 boxes



[Pattern: Add 2 boxes each time. The next figure has  $9 + 2 = 11$  boxes. The figure after that has  $11 + 2 = 13$  boxes.]

- 134** Len drew a monkey; Max drew a lion; Kay drew a seal; Sara drew a kangaroo.  
[Sara drew a kangaroo. Kay's animal splashed, so Kay's animal was the seal. Max did not draw a monkey since the word monkey begins with *m*. Max drew the lion and Len drew the monkey.]

- 135** One possible set of answers:  
0.2, 0.6, 2.6, 4.8  
[Suggest students use number sense.]

- 136** 10 paths [Suggest students use centimeter squared paper and consider simpler problems by moving point B closer to point A.]

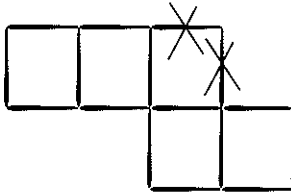
- 137** 99 [The smallest sum made only of 2's is 222.  $222 - 123 = 99$ ]

- 138** 1 half-dollar, 1 quarter, 1 dime, 2 nickels, 5 pennies [Suggest students act it out using coins.]

- 139** 5.5 [ $8.2 - 2.8 = 5.4$ ;  $5.4 \div 2 = 2.7$ ;  $2.8 + 2.7 = 5.5$ , and  $8.2 - 2.7 = 5.5$ ]

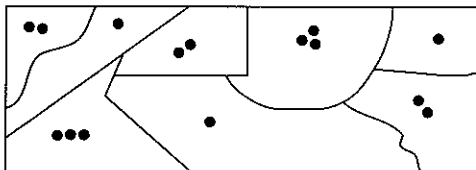


- 140** One possible answer is shown.



[Note the problem does not state that the 4 squares have to be connected. Some students may find a solution with disconnected squares.]

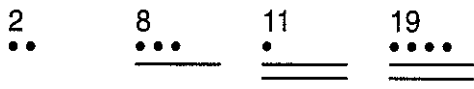
- 141** 49.1 cm long  
[There are only 9 connections.  
 $50\text{ cm} - 0.9\text{ cm} = 49.1\text{ cm}$ ]
- 142** Margo chose a mystery, Nick chose a science book, Omar chose a joke book, and Pam chose a biography.  
[Omar giggled as he read the joke book. Margo pretended she was a detective as she read a mystery. If Nick is not reading about a president, then Pam is. So Nick is reading a science book and Pam is reading the biography.]
- 143**  $9 \times 5 = 45$ ,  $6 \times 8 = 48$ ,  $10 \times 7 = 70$   
[Suggest students cut out a model and fold it into a cube to find the numbers on opposite faces.]
- 144** 48 boxes [Students can use centimeter squared paper. A total of 16 boxes (only the fourth and eighth columns) have some color.  $64 - 16 = 48$ ]
- 145** One possible answer includes calculating:  $8 \times 3 \times 7 \times 2$ , or calculating  $12 \times 28$ . [Consider that there are many ways to write a number.  $24 = 8 \times 3 = 12 \times 2 = 23 + 1$ ,  $25 - 1$ , etc.;  $14 = 7 \times 2 = 13 + 1 = 15 - 1$ , etc.]
- 146** One possible answer is shown.



- 147** Possible answers include 800 because it is the only multiple of 10; 707 because it is the only palindrome or because it is the only one in which the last one or two digits are not the product of the first two digits.
- 148** 6 arrangements; Real words are TAN, ANT, and if you count common names, NAT.
- 149** One possible answer: 825-3336  
[There are 60 possible answers. Five of the seven numbers are 8, 3, 3, 3, and 6. Since  $8 + 3 + 3 + 3 + 6 = 23$  and  $30 - 23 = 7$ , the other two numbers (not 3's) must have a sum of 7. They are 0, 7; 1, 6; or 2, 5.]
- 150** 55¢ [Jamaal has twice as many dimes as quarters. Half as many quarters as nickels is the same as twice as many nickels as quarters. Since he has only 5 coins in all, he must have 1 quarter, 2 dimes, and 2 nickels.  
 $25¢ + 20¢ + 10¢ = 55¢$ ]
- 151** TEAM, MEAT, MATE, and TAME  
[Suggest students make an organized list of possibilities.]
- 152**  $41 + 425$  [Since the sum of the numbers is 466, one of the numbers must be a 3-digit number. There are two possibilities to check:  $41 + 25$  or  $41 + 425$ . Since  $41 + 25$  does not equal 466, the correct solution is  $41 + 425 = 466$ .]
- 153** 914 [There are 13 even-numbered rooms: 902, 904, 906, 908, 910, 912, 914, 916, 918, 920, 922, 924, 926. The middle room is 914.]
- 154** 6¢, 11¢, 15¢, 26¢, 30¢, 35¢, 51¢, 55¢, 60¢, 75¢ [Suggest students make a list and act it out. penny, nickel; penny, dime; penny, quarter; penny, half-dollar; nickel, dime; nickel, quarter; nickel, half-dollar; dime, quarter; dime, half-dollar; quarter, half-dollar.]

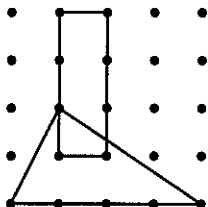
## Solution Key

- 155 See answers below.



[The Mayas used from 1 to 4 dots for the numbers 1 through 4. A bar stands for 5.]

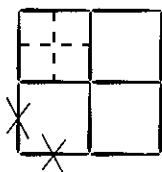
- 156 One possible answer is shown.



- 157 One possible rule: Multiply by 3; then add 2; 17, 26, 32, 101. Another rule: Add 1, multiply by 3, and then subtract 1.

- 158 20 cards, 5 gifts [Each of the 5 cousins makes 4 cards and chips in for 1 gift.  
 $5 \times 4 = 20$ ;  $5 \times 1 = 5$ ]

- 159 One possible answer is indicated.



- 160 Both answers are shown.

6	11	4
5	7	9
10	3	8

10	3	8
5	7	9
6	11	4

[In a magic square, the magic sum is found by summing the three middle numbers in the list of possible numbers: 3, 4, 5, 6, 7, 8, 9, 10, 11. The magic sum is  $6 + 7 + 8 = 21$ . Place the numbers 6, 7, and 8 in either ascending or descending order along either diagonal. Then use Guess and Check to complete the square.]







